

SOLAR PHYSICS

*A Journal for Solar Research and the Study of
Solar Terrestrial Physics*

VOLUME 49



D. REIDEL PUBLISHING COMPANY

DORDRECHT-HOLLAND/BOSTON-U.S.A.

SOLAR PHYSICS

A Journal for Solar Research and the Study of

Solar Terrestrial Physics

VOLUME 10

J. A. van den Kerkhof, Editor
P. A. M. van der Grinten, Editor
J. A. M. van der Grinten, Editor
P. A. M. van der Grinten, Editor

J. A. van den Kerkhof, Editor
P. A. M. van der Grinten, Editor
J. A. M. van der Grinten, Editor
P. A. M. van der Grinten, Editor

All Rights Reserved

Copyright © 1976 by D. Reidel Publishing Company, Dordrecht, Holland
No part of the material protected by this copyright notice may be reproduced or
utilized in any form or by any means, electronic or mechanical,
including photocopying, recording or by any informational storage and
retrieval system, without written permission from the copyright owner

Printed in The Netherlands

TABLE OF CONTENTS

ARTICLES

AKIMOV, L. A., <i>see</i> Livshits, M. A. <i>et al.</i>	
ANDERSEN, T., P. PETERSEN, and Ö. HAUGE / The Solar Hafnium Abundance	211
ANTIOCHOS, S. K. and P. A. STURROCK / Influence of Magnetic Field Structure on the Conduction Cooling of Flare Loops	359
ARMSTRONG, T. P., S. M. KRIMIGIS, D. HOVESTADT, B. KLECKER, and G. GLOECKLER / Observation of Temporal and Spatial Variations in the Fe/O Charge Composition of the Solar Particle Event of 4 July, 1974	395
AVERY, L. W. / Observations of Quasiperiodic Variations in the Solar Flux at 10.7 GHz	141
BAI, T. and R. RAMATY / Gamma-Ray and Microwave Evidence for Two Phases of Acceleration in Solar Flares	343
BELKINA, I. L., <i>see</i> Livshits, M. M. <i>et al.</i>	
BRAY, R. J., R. E. LOUGHHEAD, and E. J. TAPPERE / Convective Velocities Derived from Granule Contrast Profiles in Fe I $\lambda 6569.2$	3
BROWN, J. C. and A. N. MCCLYMONT / Oscillations of Coronal Electron Traps Inferred from Hard X-Ray Data	329
DULK, G. A., S. F. SMERD, R. M. MACQUEEN, J. T. GOSLING, A. MAGUN, R. T. STEWART, K. V. SHERIDAN, R. D. ROBINSON, and S. JACQUES / White Light and Radio Studies of the Coronal Transient of 14-15 September 1973. I: Material Motions and Magnetic Field	369
DRYER, M., <i>see</i> Wu, S. T. <i>et al.</i>	
DYATEL, N. P., <i>see</i> Livshits, M. A. <i>et al.</i>	
ENGVOLD, O. / The Fine Structure of Prominences. I: Observations - Ha Filtergrams	283
FELDMAN, W. C., <i>see</i> Sheeley, N. R. <i>et al.</i>	
GLOECKLER, G., <i>see</i> Armstrong, T. P. <i>et al.</i>	
GOLUB, L., A. S. KRIEGER, and G. S. VAIANA / Distribution of Lifetimes for Coronal Soft X-Ray Bright Points	79
GOSLING, J. T., <i>see</i> Dulk, G. A. <i>et al.</i>	
HAN, S. M., <i>see</i> Wu, S. T. <i>et al.</i>	
HARVEY, J. W., <i>see</i> Sheeley, N. R., Jr. <i>et al.</i>	
HAUGE, Ö., <i>see</i> Andersen, T. <i>et al.</i>	
HERISTCHI, Dj., G. TROTTET, and J. PEREZ-PERAZA / Upper Cutoff of High Energy Solar Protons	151
HOLZER, T. E., <i>see</i> Kopp, R. A.	
HOVESTADT, D., <i>see</i> Armstrong, T. P. <i>et al.</i>	
JACQUES, S., <i>see</i> Dulk, G. A. <i>et al.</i>	
KLECKER, B., <i>see</i> Armstrong, T. P. <i>et al.</i>	
KOPP, R. A. and T. E. HOLZER / Dynamics of Coronal Hole Regions. I: Steady Polytropic Flows with Multiple Critical Points	43

KOUTCHMY, S. and G. STELLMACHER / Photometric Study of Chromospheric and Coronal Spikes Observed during the Total Solar Eclipse of 30 June, 1973	253
KRIEGER, A. S., <i>see</i> Golub, L. <i>et al.</i>	
KRIEGER, A. S., <i>see</i> McIntosh, P. S. <i>et al.</i>	
KRIMIGIS, S. M., <i>see</i> Armstrong, T. P. <i>et al.</i>	
LIVSHITS, M. A., L. A. AKOMOV, I. L. BELKINA, and N. P. DYATEL / Helium Emission in the Middle Chromosphere	315
LOUGHHEAD, R. E., <i>see</i> Bray, R. J. <i>et al.</i>	
MACIEL, W. J., <i>see</i> Singh, P. D.	
MACQUEEN, R. M., <i>see</i> Dulk, G. A. <i>et al.</i>	
MAGUN, A., <i>see</i> Dulk, G. A. <i>et al.</i>	
MÄTZLER, C. / Continuous Injection Model for Hard X-Ray Correlated Microwave Bursts	117
MCCLYMONT, A. N., <i>see</i> Brown, J. C.	
MCINTOSH, P. S., A. S. KRIEGER, J. T. NOLTE, and G. VAIANA / Association of X-Ray Arches with Chromospheric Neutral Lines	57
MEIN, N. and P. MEIN / Velocity Waves in the Quiet Solar Chromosphere	231
MEIN, P., <i>see</i> Mein, N.	
MOLODENSKY, M. M. / Equilibrium and Stability of the Force-Free Magnetic Field III	279
NOLTE, J. T., <i>see</i> McIntosh, P. S. <i>et al.</i>	
PALLAVICINI, R. and G. S. VAIANA / The Spatial Structure of a Solar Flare in Soft X-Rays and Centimetric Wavelengths	297
PEREZ-PERAZA, J., <i>see</i> Heristchi, Dj. <i>et al.</i>	
PETERSEN, P., <i>see</i> Andersen, T. <i>et al.</i>	
RAMATY, R., <i>see</i> Bai, T.	
ROBINSON, R. D., <i>see</i> Dulk, G. A. <i>et al.</i>	
SAMAIN, D. and P. C. SIMON / Solar Flux Determination in the Spectral Range 150–210 nm	33
SCHRÖTER, E. H. and H. WÖHL / Differential Rotation and Giant Cell Circulation of Solar Ca ⁺ -Network	19
SHEELEY, N. R., JR., J. W. HARVEY, and W. C. FELDMAN / Coronal Holes, Solar Wind Streams, and Recurrent Geomagnetic Disturbances: 1973–1976	271
SHERIDAN, K. V., <i>see</i> Dulk, G. A. <i>et al.</i>	
SIMON, P. C., <i>see</i> Samain, D.	
SINGH, P. D. and W. J. MACIEL / Possibility of ²⁴ MgH ⁺ in the Solar Atmosphere – High Resolution Rotation-Vibration Spectra	217
SMERD, S. F., <i>see</i> Dulk, G. A. <i>et al.</i>	
STELLMACHER, G., <i>see</i> Koutchmy, S.	
STEWART, R. T., <i>see</i> Dulk, G. A. <i>et al.</i>	
STURROCK, P. A., <i>see</i> Antiochos, S. K.	
SVALGAARD, L. and J. M. WILCOX / The Hale Solar Sector Boundary	177
TAPPERE, E. J., <i>see</i> Bray, R. J. <i>et al.</i>	
TROTTET, G., <i>see</i> Heristchi, Dj. <i>et al.</i>	

TABLE OF CONTENTS

ULMSCHNEIDER, P. / Is the Solar 5 min Oscillation an Important Heating Mechanism for the Chromosphere and the Corona?	249
VAIANA, G. S., <i>see</i> Golub, L. <i>et al.</i>	
VAIANA, G. S., <i>see</i> McIntosh, P. S. <i>et al.</i>	
VAIANA, G. S., <i>see</i> Pallavicini, R.	
WILCOX, J. M., <i>see</i> Svalgaard, L.	
WÖHL, H., <i>see</i> Schröter, E. H.	
WU, S. T., M. DRYER, and S. M. HAN / Interplanetary Disturbances in the Solar Wind Produced by Density, Temperature, or Velocity Pulses at 0.08 AU	187

RESEARCH NOTES

KUNDU, M. R. and SOU-YANG LIU / Observation of a Coronal Hole at 85 GHz	267
MACHADO, M. E. / On the Origin of the Flare Optical Continuum	91
SOU-YANG-LIU, <i>see</i> Kundu, M. R.	

INVITED PAPER

VAN HOVEN, G. / Solar Flares and Plasma Instabilities: Observations, Mechanisms and Experiments	95
---	----

ABSTRACTS OF FORTHCOMING PAPERS	205,409
---------------------------------	---------

ABSTRACTS OF PAPERS FROM OTHER JOURNALS

BROWN, JOHN C. and PETER HOYNG: 'Betatron Acceleration in a Large Solar Hard X-ray Burst', <i>Astrophys. J.</i> 200 (1975), 734-746. (Authors' abstract)	414
CHIPMAN, E. and E. C. BRUNER, JR.: 'The Solar Spectrum from 1173 to 1324 Å', <i>Astrophys. J.</i> 200 (1975), 765-772. (Authors' abstract)	415
FELDMAN, U., S. GOLDSMITH, J. L. SCHWOB, and G. A. DOSCHEK: 'The Spatial and Temperature Structure of Vacuum Spark Plasmas', <i>Astrophys. J.</i> 201 (1975), 225-237. (Authors' abstract)	415
GLOECKLER, G., D. HOVESTADT, O. VOLLMER, and C. Y. FAN: 'Unusual Emission of Iron Nuclei from the Sun', <i>Astrophys. J.</i> 200 (1975), L45-L48. (Authors' abstract)	415
HILL, H. A. and R. T. STEBBINS: 'The Intrinsic Oblateness of the Sun', <i>Astrophys. J.</i> 200 (1975), 471-483. (Authors' abstract)	413
HILL, H. A., R. T. STEBBINS and J. R. OLESON: 'The Finite Fourier Transform Definition of an Edge on the Solar Disk', <i>Astrophys. J.</i> 200 (1975), 484-498. (Authors' abstract)	413
IRGASHEV, J. I.: 'Some Peculiarities of the Velocity Field in Active Regions', <i>Izv. Krim. astrofiz. obs.</i> 54 (1976), 233. (N. STEPANYAN)	207
KOTOV, V. A.: 'The Rotation of Gas in Sunspots', <i>Izv. Krim. astrofiz. obs.</i> 54 (1976), 184. (N. STEPANYAN)	207
MERNEY, S. F. and S. T. SUESS: 'Corrections to the Azimuthal Component of the Interplanetary Magnetic Field Due to Meridional Flow in the Solar Wind', <i>Astrophys. J.</i> 200 (1975), 503-509. (Authors' abstract)	415
OGIR, M. B. and L. I. YUROVSKAYA: 'Structure of the Magnetic Fields of Active Regions and Noise Storms', <i>Izv. Krim. astrofiz. obs.</i> 54 (1976), 201. (N. STEPANYAN)	207
RIGHINI, G. and M. SIMON: 'Solar Brightness Temperature Distribution at 350 and 450 Microns', <i>Astrophys. J.</i> 203 (1976), L95-L97. (Authors' abstract)	414

SCHWARTZ, ROBERT A. and ROBERT F. STEIN: 'Waves in the Solar Atmosphere. IV. Magneto-Gravity and Acoustic-Gravity Modes', <i>Astrophys. J.</i> 200 (1975), 499-502. (Authors' abstract)	413
SHINE, R. A., R. W. MILKEY, and DIMITRI MIHALAS: 'Resonance Line Transfer with Partial Redistribution. VI. The Ca II K-Line in Solar-Type Stars', <i>Astrophys. J.</i> 201 (1975), 222-224. (Authors' abstract)	416
SKUMANICH, A., C. SMYTHE, and E. N. FRAZIER: 'On the Statistical Description of Inhomogeneities in the Quiet Solar Atmosphere 1. Linear Regression Analysis and Absolute Calibration of Multichannel Observations of the Ca ⁺ Emission Network', <i>Astrophys. J.</i> 200 (1975), 747-764. (Authors' abstract)	413
SLEPYAN, V. A., T. L. SLUTSKAYS, and N. N. STEPANYAN: 'Application of Pattern Recognition Methods to the Problem of Forecasting of Sunspot Group Development', <i>Izv. Krim. astrofiz. obs.</i> 54 (1976), 244. (N. STEPANYAN)	207
VERNAZZA, JORGE E., EUGENE H. AVRETT, and RUDOLF LOESER: 'Structure of the Solar Chromosphere. II. The Underlying Photosphere and Temperature-Minimum Region', <i>Astrophys. J. Suppl. Ser.</i> (1976), p. 844. (Authors' abstract)	414